

Mice and Rats in and around Schools

University of Nebraska—Lincoln
Extension



UNIVERSITY OF
Nebraska
Lincoln

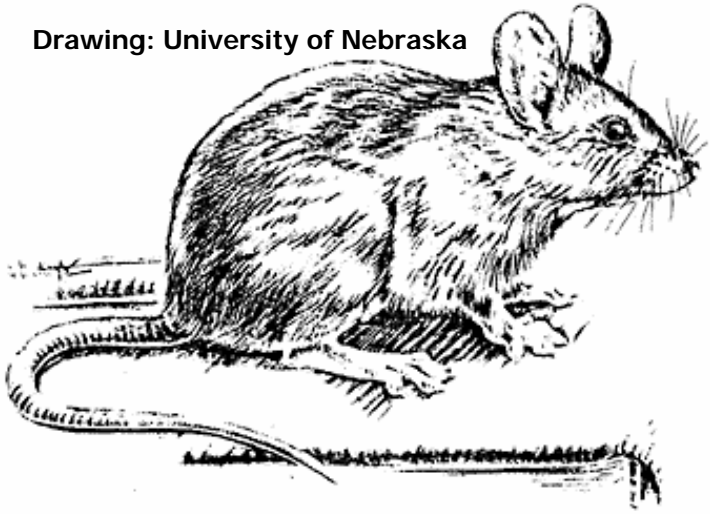
To Know Your Enemy is to Control Your Enemy

- ❖ Identification (Morphology)
- ❖ Know Abilities (Physiology)
- ❖ Know Habits (Behavior)
- ❖ Know Life History (Biology)



House Mouse

Drawing: University of Nebraska

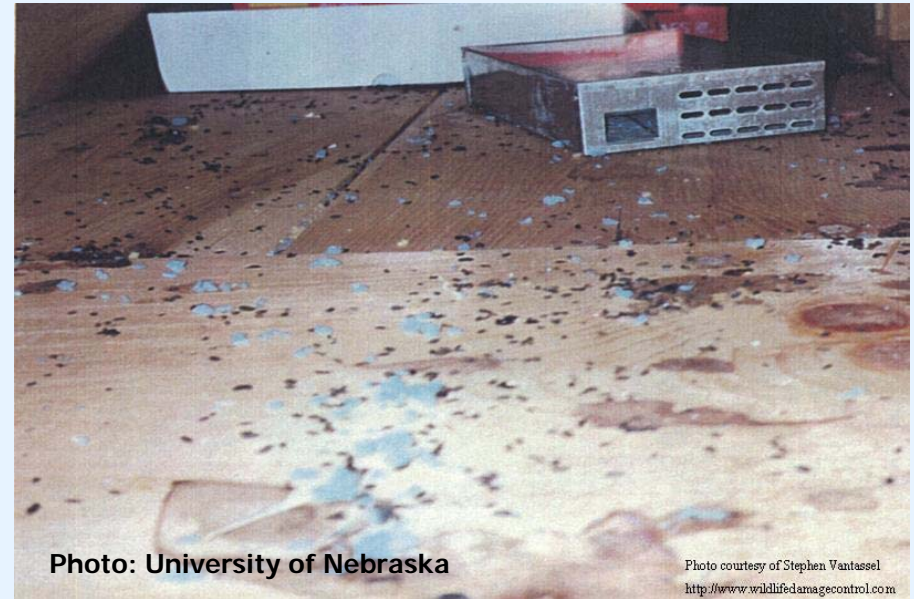


- ❖ Normally gray to brown fur
- ❖ Domesticated could be almost any color
- ❖ Grayish underside
- ❖ Long single colored tail
- ❖ Large ears that stand up
- ❖ 2.5-3.75" body length



Rodent Contamination

- ❖ Each mouse can leave 50-75 droppings a day
- ❖ Their urine can contaminate dozens of pounds of product in a day



Rodent Damage

- ❖ Mice leave two teeth marks from their incisors: each is about 1mm wide and adjacent to each other in a parallel line with a small ridge between.
- ❖ Mice teeth are extremely hard and capable of penetrating many hard materials.



Rodent Damage



Photo: USDA-APHIS



House Mouse Senses

❖ Vision

- Color blind, no red
- 1-2 ft. only for objects
- Up to 45' for movement

❖ Hearing

- Average < 45 KHz
- Semi-functional sonar



House Mouse Senses

❖ Taste

- Not very good, more learned

❖ Smell

- Best sense; > 250 ppb

❖ Touch

- Very good; use whiskers and guard hairs



House Mouse Physical Abilities

- ❖ Speed

 - 4-6 mph

- ❖ Jump up

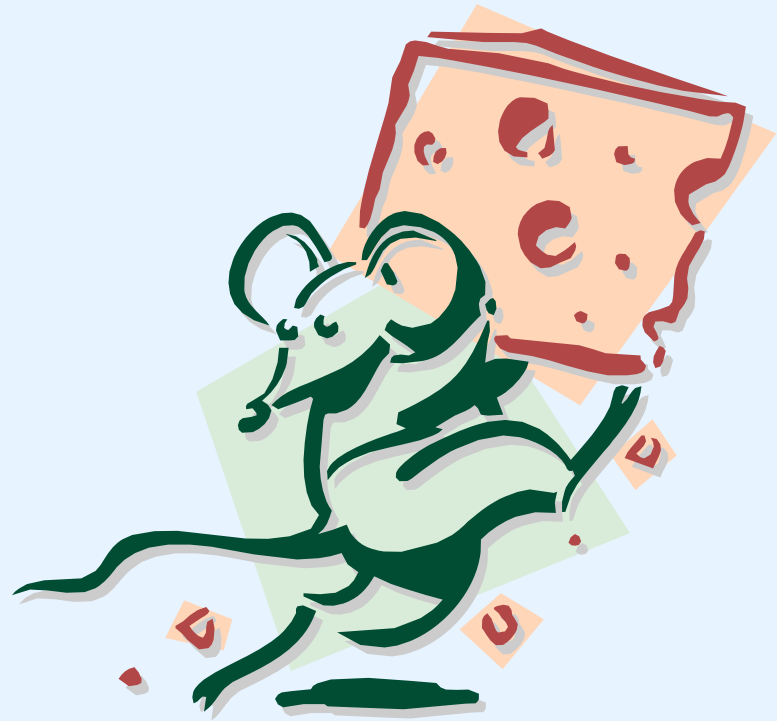
 - 1.0-1.8 ft

- ❖ Leap across

 - 2.5-3.0 ft

- ❖ Vertical Drop

 - 8-9 ft



House Mouse

Physical Abilities

❖ Climbs:

- Any rough surface

❖ Tight rope:

- Walks on a 10g wire

❖ Swims:

- Poor swimmer

❖ Young can squeeze through a $\frac{1}{4}$ " opening



House Mouse Behavior

❖ Home Range

- 20' radius

❖ Territory

- 6-8' radius

❖ Exploration

- Curious; always exploring

❖ Migrations

- Move when overcrowded, or if there are changes in environmental conditions



House Mouse Behavior

❖ Water

- Only need .01/oz per day
- Can go 4 months without
- Get most from food
 - ✓ Eat protein=need water
 - ✓ Eat sugar/carbs=make water



Photo: USDA-APHIS



House Mouse Behavior

❖ Omnivorous

- Eat 10% of body weight/day
- Wide variety of foods
- Learn what is available and search

❖ Preferences

- What they are used to in that area



Photo: USDA-APHIS



House Mouse Foraging Behavior

❖ Natural Strategy

- Nibblers
- Eat most at site
- Store small amounts

❖ Activity Peaks

- Pre-Dawn
- Post-Dusk

❖ Frequency

- 30-40 short trips/day



House Mouse Reproduction

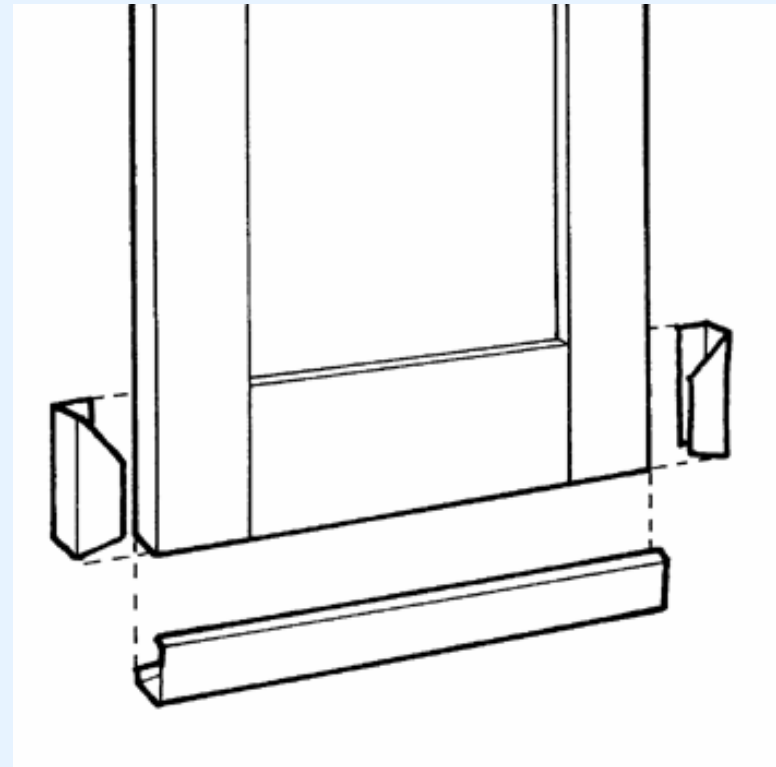
- ❖ Mature at one month
- ❖ 18-21 days gestation
- ❖ 6-12 in each litter
- ❖ Each female: up to 10 litters



Mouse Integrated Pest Management (IPM)

❖ Exclusion

- Place strips around doors



Drawing: University of Florida/Institute
of Food and Agricultural
Sciences, "Rat and Mouse Control," 1997.

Mouse IPM

❖ Habitat Modification / Elimination

- Seal up holes/cracks
- Keep areas free of clutter



Photo: University of Nebraska



Mouse IPM



❖ Food Reduction

- Clean up crumbs
- Wash dishes and counters to reduce build up of food on surfaces
- Mop floors



Mouse IPM

❖ Trapping

- Various kinds: live, snap, glue boards, etc.



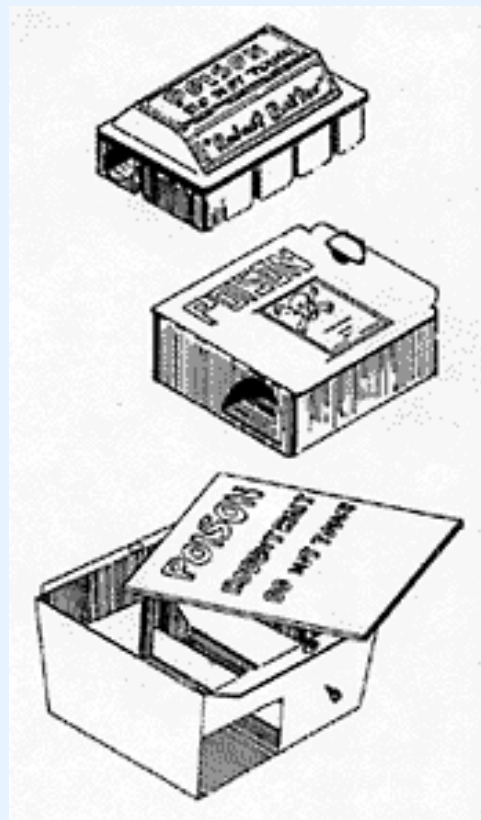
Photo: University of Florida



Mouse IPM

❖ Baiting

- Keep out of reach of children and pets



Drawing: University of Nebraska



Norway Rat

- ❖ Grayish brown; can be light gray to black
- ❖ Light cream to tan underside
- ❖ Long hairless tail
- ❖ 16 inches long
- ❖ Average adult is 12-16 oz.



Photo: USDA-APHIS



Rat Senses

❖ Vision

- Poor; mainly movement
- Color blind

❖ Hearing

- Average; close to ours



Photo: Iron Clad Pest Control



Rat Senses

❖ Taste

- Learned

❖ Smell

- Excellent; most important

❖ Touch

- Many whiskers and guard hairs



Photo: Iron Clad Pest Control



Rat Physical Abilities



- ❖ Speed
 - 5-6 mph
- ❖ Vertical Jump
 - 3 ft up
- ❖ Horizontal Jump
 - 8-10 ft across
- ❖ Vertical Drop
 - Easily 12-20 ft



Rat Physical Abilities

❖ Tight rope

- Any pipe or $\frac{1}{4}$ " wire

❖ Swims

- Excellent swimmer

❖ Squeeze

- Young can fit into $\frac{1}{2}$ " slot



Photo: USDA-APHIS



Rat Behavior

❖ Home Range

- 500 ft radius

❖ Territory

- 100 ft radius

❖ Exploration

- Very leery, seldom explore

❖ Migrations

- Move when pushed out by others



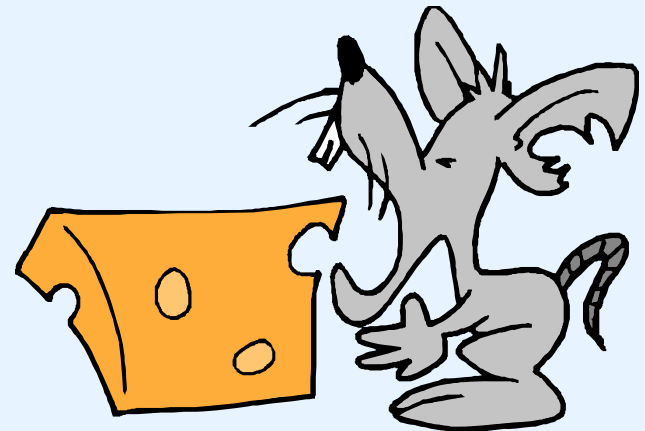
Rat Foraging and Feeding Behavior

❖ Natural Strategy

- Gather food; bring to nest
- Eat at nest site
- Store food

❖ Frequency

- Search only as needed



Rat Foraging and Feeding Behavior

❖ Water

- Must drink water

 - ✓ 2 oz./day

❖ Omnivorous - *eats both animal and vegetable products*

- Variety of food

- Want high quality protein

❖ Preferences

- Have innate preferences



Rat Reproduction



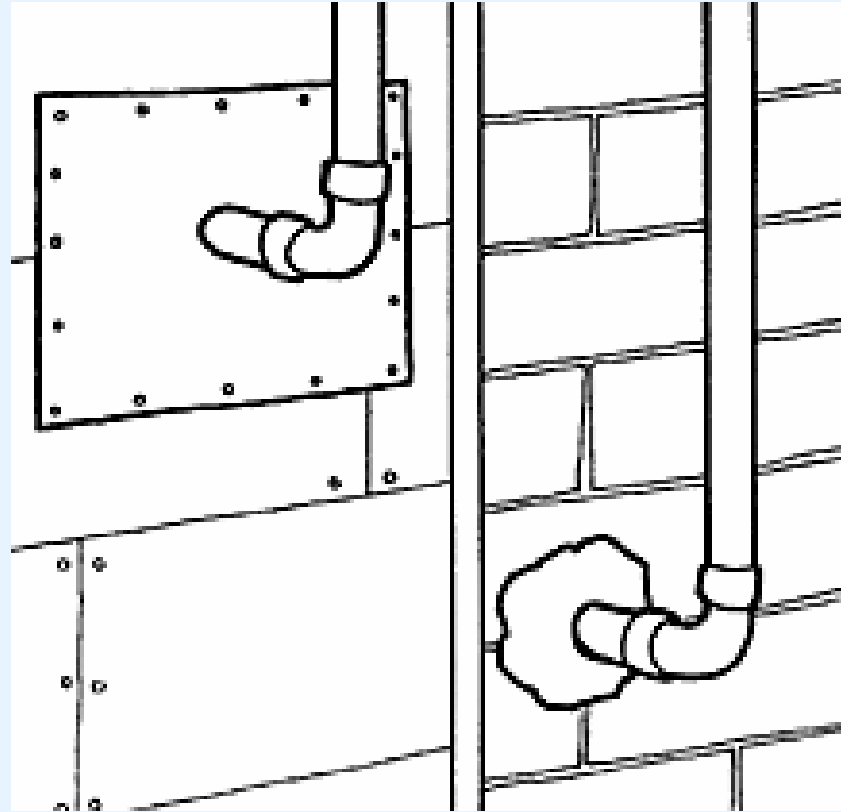
- ❖ Mature at 12 weeks
- ❖ 22 days to gestation
- ❖ 8-12 in a litter
- ❖ Numbers of litters determined by amount of food/water



Rat Integrated Pest Management (IPM)

❖ Exclusion

- Put metal plates around pipes



Drawing: University of Florida/Institute of Food and Agricultural Sciences, "Rat and Mouse Control," 1997.



Rat IPM

❖ Habitat Modification / Elimination

- Seal cracks and repair holes around buildings



Photo: University of Nebraska



Photo: University of Nebraska



Rat IPM

❖ Food Reduction

- Clean up crumbs
- Wash dishes and counters to reduce buildup of food on surfaces
- Mop floors



Rat IPM

❖ Trapping

- Various kinds: live, snap, glue boards, etc.



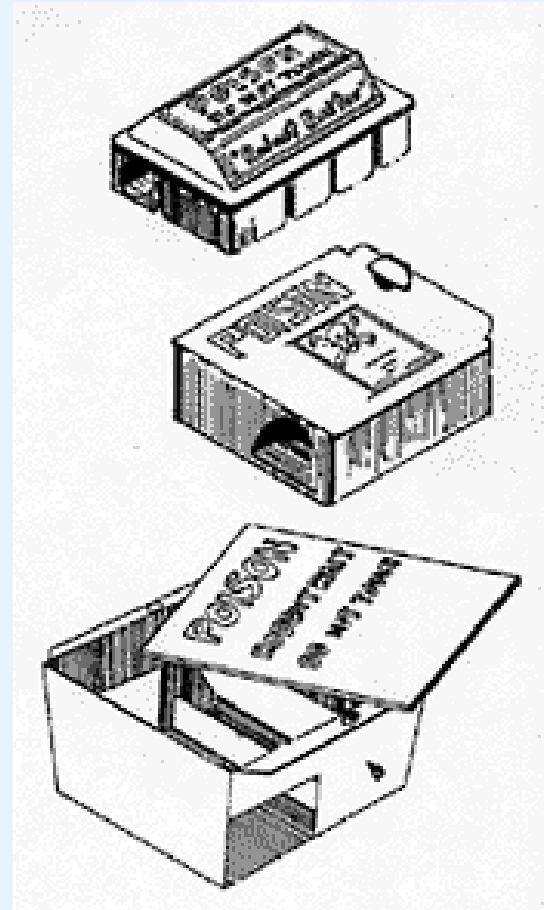
Photo: University of Nebraska



Rat IPM

❖ Baiting

- Keep out of reach of children and pets



Drawing: University of Nebraska



Rodents can Transmit Disease

- ❖ Rodent droppings, urine, carcasses, and nesting materials can release allergens and potential disease pathogens into the air. Also handling of live animals carelessly could result in bites from infected rodents.



Rodents can Transmit Disease

- ❖ Diseases: hantavirus, murine typhus, scrub typhus, rickettsialpox, leptospirosis, rat bite fever, lymphocytic choriomeningitis, salmonellosis, histoplasmosis, trichinosis, rabies, plague



Cleaning Up After Rodents: Protect Yourself



❖ Protective clothing

➤ Latex gloves

- ✓ Latex can cause allergic reaction in some individuals; vinyl gloves an alternative

➤ Respirator in high risk areas

- ✓ HEPA filter mask that can filter down to 0.3 microns



Cleaning Up After Rodents: Protect Yourself

- ❖ Open windows
- ❖ Spray droppings with disinfectant before cleaning
 - Vacuuming/cleaning **dry** rodent droppings/nesting materials can increase risk of airborne allergens and potential disease pathogens.



Disposing of Dead Rodents

- ❖ Spray carcass with disinfectant
- ❖ Double-bag
- ❖ Dispose of in a covered garbage can
- ❖ Disinfect area
- ❖ Get rid of contaminated items
 - Wash gloves and discard, then wash hands
 - Pet food, paper products, etc. in affected area should be thrown out



Resources/Information

❖ Internet Center for Wildlife Damage Management

➤ <http://icwdm.org>



Credits

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❖ Content Editor

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- John Paterson, Australian Wildlife
- Christos Kambanis, Iron Clad Pest Control
- J.K. Clark, University of California
(<http://www.ipm.ucdavis.edu>)
- University of Florida
- University of Florida, Institute of Food and
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- Wildlife Services Image Collection, USDA-APHIS

❖ Artwork/Graphics

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